



## Natural Resources Conservation Service

### CONSERVATION PRACTICE STANDARD

## CLEARING AND SNAGGING

### CODE 326

(ft)

#### DEFINITION

Removal of specified vegetation along the bank (clearing) and selective removal of snags, drifts, or other obstructions (snagging) from natural or improved streams (includes channels).

#### PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Restore flow capacity and direction to prevent and/or reduce ponding and flooding
- Prevent and or reduce excessive bank erosion
- Prevent and/or reduce sediment transported to surface water
- Prevent or reduce debris impacts to infrastructure

#### CONDITIONS WHERE PRACTICE APPLIES

Any natural or improved stream where the removal of vegetation, trees, brush, and other obstructions is needed to accomplish one or more of the listed purposes.

#### CRITERIA

##### General Criteria Applicable to All Purposes

Notify landowner and/or contractor of responsibility to locate all buried utilities in the project area, including drainage tile and other structural measures. The landowner is also required to obtain all necessary permits for project installation prior to construction.

The design must address all modified flow conditions caused by clearing and snagging.

##### **Location**

Include the work limits and flow area of the stream in the area to be cleared and snagged. Trees on the bank that are leaning over or other objects that may fall into the stream may be included.

Clearing and snagging may also be used for other areas, such as temporary disposal areas or travelways, required for implementation of this practice.

##### **Capacity**

Determine the capacity of the stream, both before and after modification as needed, using NRCS National Engineering Handbook (NEH) (Title 210), Part 654, Chapter 6, "Stream Hydraulics." Select a value of Manning's "n" roughness coefficient to determine stream capacity after modification that reflects the degree of natural changes and maintenance expected to occur in future years. Other capacity analysis may be performed at the discretion of the design engineer, area engineer, or state engineer.

**Stability**

Clearing and snagging activities may affect stream stability. The effect on downstream and upstream reaches due to the removal of obstructions must be analyzed using appropriate stream geomorphologic procedures. Avoid or mitigate activities that negatively affect stability.

**Debris disposal**

Remove cleared and snagged material from the floodplain or deposit in areas or in a manner that will not significantly affect the flow capacity of the floodplain. Designate proper locations to dispose of all debris including invasive species and where the debris will not remobilize during future flood events.

Hazardous materials

Hazardous materials such as propane tanks and car bodies may be part of the debris that is to be removed. The contractor will investigate the debris in the work limit area prior to and during removal to ensure that all work is performed in a safe manner and hazardous debris is properly disposed of.

**Vegetation**

Restore all areas denuded and/or disturbed during clearing and snag removal by planting vegetation, unless the disturbance is minimal and conditions are highly conducive for natural regeneration of vegetation. Use native vegetation where practical. Vegetation established as part of this practice should include ecologically suitable species obtained from local sources wherever practical. Take precautions to prevent introduction of invasive species.

Minimize disturbance of wetlands, riparian areas, and fish and wildlife habitat sites, and avoid disturbance where possible.

The establishment of vegetation on cleared and snagged areas will be in accordance with the criteria contained within NRCS Conservation Practice Standard (CPS) Critical Area Planting (Code 342).

**CONSIDERATIONS**

Debris in stream systems affects the physical characteristics of the stream as well as the diversity and abundance of its aquatic organisms. Fisheries and/or aquatic biologists can assist in evaluating and incorporating measures to improve aquatic and riparian-wetland habitat.

Incorporate enhancements for fish and wildlife values as needed and practical. Special attention should be given to landscape aesthetics and to protecting and maintaining key shade, food, and den trees. Use NRCS CPS Stream Habitat Improvement and Management (Code 395).

In addition to NRCS CPS Critical Area Planting (Code 342), for areas where it is difficult to establish vegetation consider NRCS CPSs Riparian Herbaceous Cover (Code 390), Riparian Forest Buffer (Code 391), Access Control (Code 472), Mulching (Code 484), Streambank and Shoreline Protection (Code 580), and Tree/Shrub Establishment (Code 612).

Retain habitat-forming elements that provide cover, food, pools, and water turbulence, to the extent possible.

Root balls of fallen trees that are securely anchored in the stream or naturally formed logjams may provide fish habitat and/or stability. The effects of these items should be included in the stream capacity hydraulic analysis. Existing root structure and stumps firmly within the soil should remain to help stabilize the soil and facilitate resprouting of woody vegetation.

Erosion rates decline as a percentage of vegetative roots in a streambank increases. Selection of appropriate riparian vegetation will increase the streambank's ability to resist future erosion.

Clearing and snagging activity may resuspend sediments in the flow. Consider techniques that promote beneficial sediment deposition and the filtering of sediment.

During construction, woody materials may float downstream and cause additional snags and drifts. Incorporate measures as needed and practical to address this concern.

Schedule in-stream work to avoid environmentally sensitive periods such as spawning and migration to the fullest extent possible.

Incorporate measures and practices, as needed and practical, to address modified flow conditions that adversely affect resources such as—

- A lowered hydraulic gradient that may drain adjacent flood plains more quickly.
- Decreased ground water recharge in water-losing streams resulting from reduced residence time in the stream and adjacent floodplains.

Ground-disturbing activities associated with this practice have the potential to adversely affect protected plant species and may encourage the establishment of invasive plant species. Quickly revegetating disturbed areas can minimize the introduction of nonnative species.

Temporary erosion and sediment best management practices can be used to minimize the delivery of fine sediment to adjacent and downstream reaches.

Incorporate construction methods that enhance fish and wildlife values as needed and practical to include—

- Use of hand-operated equipment, water-based equipment, or small equipment to minimize soil, water, and other resource disturbances.
- Operation of heavy machinery from atop adjacent streambanks to the fullest extent possible.
- After the material has been removed from streambank locations, limiting machinery access to riparian areas to minimize damage to stream habitat.

No special considerations have been identified for this practice.

## **PLANS AND SPECIFICATIONS**

Prepare plans and specifications for clearing and snagging that describe the requirements for applying the practice to achieve its intended purpose(s).

As a minimum, include, as applicable, the following items in the plans and specifications:

- Map of overall area including work limits and limits of clearing and snagging required.
- Location of ingress and egress to the site.
- Description of works of improvement, extent of removal, and manner of disposal.
- Location of disposal areas or location of areas off limits for disposal of debris.
- Requirements for stabilization and vegetation in disturbed areas.
- Location and description of trees or vegetation to be left undisturbed.
- Manner and sequence of construction operations so that impacts on the environment will be minimized.
- Hazardous material identification procedure.
- Erosion control measures, as applicable.

Carry out all operations in a safe and skillful manner. Observe all safety and health regulations and use appropriate safety measures.

## OPERATION AND MAINTENANCE

Provide an operation and maintenance plan to the landowner/user to maintain stream capacity and vegetative cover. Items to include are—

- Assessing the area after each major storm event for downed trees and debris accumulation. Remove or relocate and anchor downed trees and debris accumulations that are causing bank erosion problems as soon as possible.
- Periodically inspecting the area for signs of streambank undermining or instability. Remove any debris accumulations that may contribute to the instability and closely monitor the area.
- Clearing any vegetation and/or debris that blocks side drainage structures and streams.

## REFERENCES

USDA NRCS. 2007. National Engineering Handbook (Title 210), Part 654, Stream Restoration Design. Washington, D.C. <https://directives.sc.egov.usda.gov/>

USDA NRCS. 2009. National Biology Handbook (Title 190), Part 614.00, Stream Visual Assessment Protocol Version 2. Washington, D.C. <https://directives.sc.egov.usda.gov/>